ADVANTAGES OF THE TWIN SIX PACKARD

Constant Power Pull Gives Greater Smoothness and Silence.

SHOWS FUEL ECONOMY

By J. G. VINCENT,
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Almost the whole effort in automobile engineering in the last ten years has been to combine in a practicable motor broader ability, smoother action and less noise.

All the work done in this direction has been influenced by one principle, the principle of splitting heavy stresses into lesser ones. The infrequent, smashing power stroke of the one cylinder motor, delivered once to every four revolutions of the flywheel, exerted such strain and required such construction as were incompatible with economy and comfort and early brought about the development of the two cylinder motor. In this type one power stroke was delivered to every two revolutions of the flywheel and the chief disadvantages of the internal combustion engine were lessened by half.

In the same way and at various periods the two cylinder motor went out before the four and the four in turn similarly was superseded by the six. For a considerable time the six cylinder motor seemed completely to satisfy engineering aims, but reasons gradually were discovered which made it seem advisable to split up the driving force still more.

A six cylinder motor is theoretically in perfect balance and vibrationless. But in actual practice this balance many times is nullified to a greater or less extent by the weight of the pistons of the motor. Each piston pushes and pulls on the crankshaft as it rotates and the pulls and pushes of all the pistons exert no vibratory influence just so long as the crankshaft remains absolutely stiff and true. But let there be ever so slight a twist in the shaft—let the centre of gravity of the piston mass move even by the tiny fraction of an inch—and at once we have a vibration that is detrimental to the motor and unpleasant to the passengers.

This result is in no way due to explosive force, but to the weight of the pistons being pumped to and fro by a crank. It is an engineering truth that doubling the area of a piston more than doubles its weight. Conversely if we halve its area we do more than halve its weight. The stresses due to piston movement are in relation to the weight, so that a three inch piston has less than half the power for vibration of a four inch piston.

In the case of a big piston the explosive force on the large area of its head many times is actually great enough to twist the crankshaft a little. The obvious remedy, and generally accepted, is more weight in the crankshaft and crankcase. But there is another and a better answer: less piston weight and smaller explosions.

But if we are to have a greater range of ability and preserve the advantage of balance we must have more pistons. And as soon as the effect of many small pistons of light weight and many explosions of small intensity is noted other advantages are apparent. With the reduction of strain throughout the motor through using many pistons to get the required power we save not only piston weight but flywheel weight, crankshaft weight and crankcase weight.

Further, we get more power from an engine of the same total size of capacity in cubic inches than is possible in a six of a corresponding standard of engineering. This is because the light pistons and connecting rods allow the engine a greater range of speed, while the smaller bore of the cylinders permits the use of a higher compression, and the higher the compression the more efficient is the burning of gas at all speeds. This more nearly perfect combination shows the advantage in hill climbing, in shuttling through traffic, in the use of low grade fuels and in the economy of fuel.

Naturally the first step onward from a six is an eight. And to preserve the advantages of a short, stiff crankshaft, almost sacrificed in a sizable six, and to enjoy the benefit of a short, light, stiff motor the V, or twin type, of motor construction suggested itself. Once developed the twin four revealed certain advantages when compared to a six of similar size and power.

So far as the character of the torque, or turning effort, is concerned the twin four motor has an advantage over the six by reason of the more frequent impulses of lesser intensity. Another advantage concerns weight, particularly in the crankcase, crankshaft and flywheel. In the matter of smoothness, the twin four has a discernible superiority at moderate speeds, because at these speeds the more even torque shows to advantage.

But at the higher engine speeds the advantage switches to the six cylinder motor because of the lack of balance in the four cylinder principle as compared to the six. The disadvantages of the four in this regard are retained in the eight to an appreciable extent and at high speed become displeasingly apparent in spite of the lighter pistons and shorter crankshaft.

The twin four has another inferiority to the six as concerns accessibility, as the 90 degree angle at which the cylinders are mounted makes it impractical to place the generator, water pump and such auxiliaries in the usual place, alongside the crankshaft and just inside the frame. This equipment must be mounted either below the frame or between the cylinder blocks, the first disposition being obviously inaccessible and the second in the "valve alley," making the valves themselves relatively inaccessible. In turning radius too the twin four suffers somewhat, in requiring a wide frame to allow the steering gear to pass the wide angle of the cylinder construction.

All things considered it is plain that along with the acknowledged advantages derived from the twin four reappear those characteristics of the original four which the six was designed to overcome.

The logical advance from the twin four is the twin six type of motor, since it preserves the theoretical and practical balance of the six and by the use of smaller pistons and cylinders removes those forces responsible for certain dissatisfactions with the six.

It is clear that the torque of the twin six motor must be 100 per cent. better than the single six. Six power strokes per crank shaft revolution blend together so closely as to make it impossible to distinguish any pause between them, even at very low engine speeds, as when pulling through traffic on up grades. Its operation can best be likened to the action of steam. In weight the twin six motor is lighter than the single six, and so far as accessibility is concerned is quite as satisfactory.

The 60 degree included angle at which the cylinders are set allows the placing of equipment in the usual place alongside it, and between it the frame, even permitting a narrowed foreframe and making possible a chassis with short turning radius. Only the carbureter need be set beween the cylinders, and by placing it well above the motor "valve alley" is left entirely open and all valves are easily accessible.

Aside from the structural advantages with this type of motor its superiority in performance is so pronounced as to make it a most significant factor in motor development. It is more nearly than all others the perfect result that all automobile engineers would attain in ability, smoothness and silence. Its perfect balance, its lighter parts, the higher compression possible and the improved carburetion due to uniform suction result in noticeable gasolene and oil economy to the user. And because its action is uniformly smooth at all speeds and its torque consistently even a similar economy is affected in the case of tires.

Of course actual service is the only real test of a motor's serviceability, and in this regard the twin six has even exceeded expectations. It has been very gratifying to us to watch the trend of motor development in Europe for air craft purposes, where the prime consideration has been reliable, economical power with the least possible weight. For this very important service the twelve cylinder motor has steadily been supplanting other types since the beginning of the war and is the most desirable and sought after type of motor for air craft purposes in existence to-day.

SAYS AUTO MAKERS SAVED THE COUNTRY

Lifted Industry From Depression by Optimism, Declares Harry M. Jewett.

OTHER BUSINESS AIDED

By HARRY M. JEWETT.
President Paige-Detroit Motor Car Company.

For nearly seventeen months the automobile industry has been flourishing like a green bay tree. There had been previous periods of prosperity, but the peculiar and apparently adverse conditions that have prevailed during the last year and a half have made the present extraordinary and ever expanding volume of motor car business a commercial phenomenon well worth singling out and examining, and all the more so because through sympathetic action the present booming prosperity is not confined to the makers of automobiles.

The activity of the motor car market has pulled weakening and tottering allied industries up to an almost equal plane of prosperity. The entire commercial world in fact had its backbone stiffened, thanks to the condition of the motor car business, and what a year and a half ago promised to be the beginning of national depression and disaster has turned triumphantly into national profit and well being.

What, then, is the explanation of this phenomenal advance in the motor car world which means so much to every one in this country?

Some manufacturers say it is because people will eat out meat for dinner, wear last season's clothes and forget to pay the grocer before they will think of economizing on gasolene consumption. But is it? Let's look over the evidence.

Seventeen months ago when the war broke out the almost universal inclination was to slash advertising appropriations and cut down on sales effort.

In the automobile business it looked like a small sized panic for a few days. Millions of dollars were tied up in production schedules. It seemed almost a certainty that the demand for cash abroad and the natural conservatism of the banks would make it impossible for dealers to get money enough to take their regular allotment of cars after they were produced. And even if the dealers would take them it didn't seem probable that the public would be in a buying state of mind—or pocketbook.

The natural thing to do then was to cut down the selling force, stop the advertising, put the factories on half time and save as much as possible out of the threatened wreck. And that is just what would have been done had it not been for a few level headed, far seeing men who know something of the psychology of the crowd and had an abiding faith in the stability of this country of ours.

These few men instead of retrenching threw on a few pounds more steam in advertising and selling departments. They talked optimism and common sense and by the force of their example swung the entire industry into line in an aggressive, constructive campaign of confidence building trade promotion. Everybody knows what the result has been. Instead of depression and disaster the automobile industry has enjoyed the most prosperous year in its history. Hundreds of thousands of men have been furnished with steady work. Allied industries have been benefited and the general prosperity of the country has been promoted.

And the credit for it all and for the widespread resultant general prosperity must inevitably go to that little group of farsighted, strong hearted men who by their faith and optimism stemmed the tide of doubt and fear that started on its pessimistic way across the country in August, 1914.

HEATERS HELP TO KEEP CARS GOING

More Driving in the City in Winter Since They Were Introduced.

"Of all accessories designed to contribute to the comforts of an automobile, the heater which keeps out the chilly blasts of winter and makes the motor car snug and warm is probably the most popular," contends A. C. Bergman, manager of the New York service branch of the Perfection Spring Service Company.

"While motor cars have always been used extensively in New York city during the winter time, there is a noticeable increase in the number being driven this season. This is undoubtedly due to the use of equipment for heating the interior of the cars, as a remarkable percentage of the automobiles that come into our service station are furnished with such comfort giving facilities.

"And of those automobiles that are not equipped with heaters which are brought to us for adjustment or repairs to springs a constantly increasing number are left a few hours longer to be equipped with Perfection heaters. Of course there is a big demand right at this time of the year also on account of our extensive advertising campaign, which keeps our force of workmen busy installing heaters on cars that are brought in solely for that purpose.

"The installation of the Perfection heater on hundreds of automobiles the past four years has been largely responsible for the popularity of winter driving. Once installed it requires no attention other than the regulation of the degree of heat by a single movement of the foot. There is no maintenance cost, as it utilizes waste heat from the exhaust, adequate provision being made for the elimination of all noise, odor or fire danger and with absolutely no back pressure on the motor.

"In operating the automobile at the moderate pace required in city driving it will heat limousine or a seven passenger touring car with side curtains up to a comfortable temperature in ordinary winter weather.

"A commercial type of Perfection heater has been perfected for florists, grocers and other merchants who deal in perishable goods which are liable to frost damage during delivery. Taxicab companies and omnibus lines are also finding this type of heater a profitable investment. The buses on the Fifth avenue line are so equipped.

"People are demanding 'year round' service from their motor cars and the Perfection heater as much as any other one thing makes driving as comfortable during the coldest weather as in the balmiest summer months. It is no longer necessary to 'lay up' the car for the winter and forego the pleasure of a jaunt out in the brisk and peppery air of a beautiful winter day.

"All of this simply indicates the trend of the demand of the motoring public, which is for comfort and convenience. And service is one of the biggest contributing factors in their attainment.

"Realizing this, we have provided adequate facilities so that users of our springs and heaters can secure whatever assistance is necessary to get satisfaction from the use of the article. Our present equipment is such that we can take care of the installation of as many as fifty heaters a day."

Will Use Plenty of Steel.

This year's consumption of sheet steel at the Willys-Overland plant will total over 50,000,000 pounds, or 25,800 tons, to be exact.

ALUMINUM PISTONS IN THE NEW KING MODELS

Makers Claim More Speed, Less Wear and Fuel Economy for Them.

Aluminum alloy pistons are making their appearance in the construction of automobile motors. The latest concern to adopt the aluminum piston is the King Motor Car Company of Detroit, which is employing this material in the new eight King just announced.

Aluminum alloy pistons increase the horse-power of a motor, the acceleration, liveliness, maximum speed and fuel economy and reduces the carbonization. Other claims made for the aluminum piston are that they cut down the wear on the crankshaft and connecting rod bearings and the strains on the connecting rod bolts.

"An aluminum piston weighs about one-third as much as the same size and shape iron piston," declares Assistant General Manager J. B. Siegfried of the King Motor Car Company. "When a motor is running the pistons are going up and down a good many hundred times a minute. Every time a piston reaches the end of its stroke it has to be stopped and started moving in the opposite direction. By reducing the weight of the piston itself the force or inertia that has to be overcome at each end of the stroke is reduced.

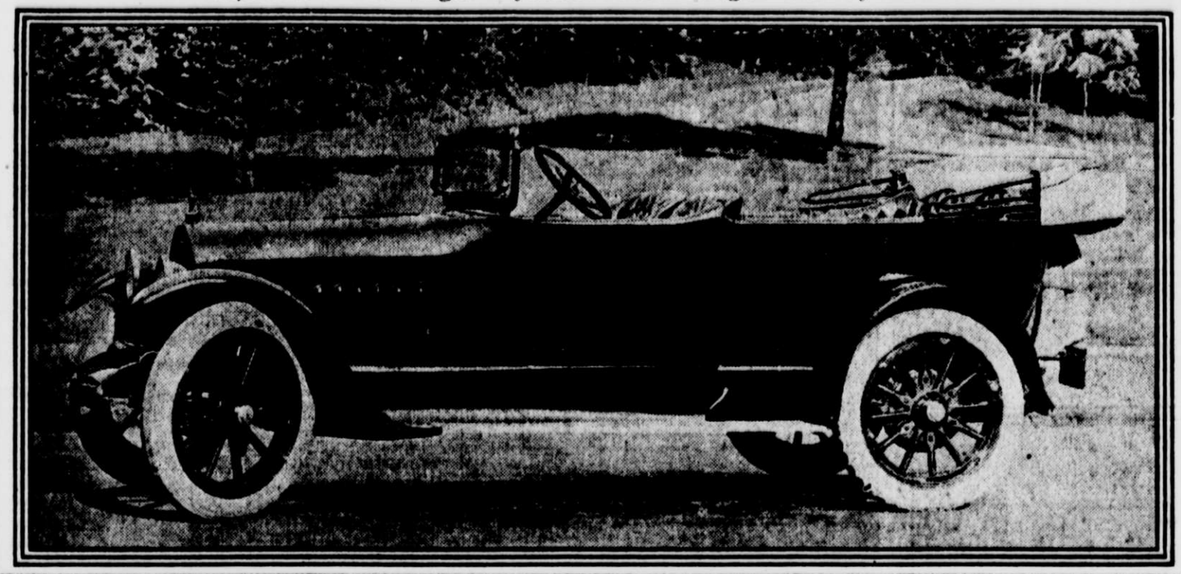
"As for the question of fuel economy, if while doing a certain amount of work itself an engine has to use less power to overcome its internal friction it will not have to use up so much fuel to do that work.

"While aluminum pistons cost a manufacturer anywhere from $2 to more than $5 per motor more than the iron pistons, the advantage derived is worth the extra expense. Savings to customers in fuel consumption and other good features repay the manufacturer for the extra expense as they are all good sales talking points."

First Cantilever Spring Car.

The King Motor Car Company of Detroit was the first to employ the cantilever type of rear springs for motor cars. To-day this type of spring suspension is finding its way on the majority of cars.

Impressive New Eight Cylinder Car Brought Out by Peerless



Mercer 22-72 Runabout Has Sporting Lines

WHERE HAD HE BEEN?

Advertisement Fourteen Years Old Sent to Olds Factory.

The average life of an advertisement has been variously estimated at from a few days to several months and cases have been known where newspaper or other periodical advertisements have continued to bring results for years following their publication.

One such instance has come to the attention of the Olds Motor Works, whose factory is quite generally looked upon as the great-granddad of the motor car business and who were the very first advertisers of motor vehicles in this country. An inquiry containing a clipping of an advertising of the old curve dash runabout was received from a prospective car buyer in Evergreen, a small place in Virginia.

The advertisement, which appeared in the latter part of 1901 and was undoubtedly one of the first automobile advertisements ever published, featured the old curve dash car as the "best thing on wheels," and the postmark showed that the letter was mailed actually more than fourteen years after the Olds Motor Works advertisement was printed.

SPECIAL A. C. PLUGS MADE.

Constructed for Particular Requirements of Leading Cars.

Nearly all the leading motor cars are furnished with A. C. Cico or A. C. Titan spark plugs as standard equipment. A few are not. For these cars the Champion Ignition Company of Flint, Mich., announce the production of special plugs for their particular requirements.

These plugs are made in exact sizes, exact threads and fit and operate perfectly in the cars for which they are intended. They can now be obtained from all A. C. plug dealers everywhere.

The popularity of A. C. plugs is best evidenced by the fact that they are used in fifty-one leading American cars as standard equipment.

Touring Model by Stutz, the Year's Race Champion